# **Novel Ammunition Acquisition**

**Approach Yields** 

**Positive Results** 

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n early 2001, the 105mm cannon was selected for the Stryker Mobile Gun System (MGS). A key requirement for the main armament on the MGS was to provide holes in 8" double-reinforced concrete walls large enough for infantry entry. One of the key factors that drove a 105mm-cannon selection was the considerable stockpile of 105mm ammunition formerly used on the Abrams M1 tank and later slated to be used on the 105mm Armored Gun System.

The new M467E1 (blue) training round and M393E3 (green) tactical round were thoroughly tested for performance and dispersion at Yuma Proving Ground. (U.S. Army photo.)

The U.S. Army stockpile round that was best suited to meet the MGS requirement was the 105mm M393A2 High Explosive Plastic-Tactical Cartridge (HEP-T). The M393A2 was Type Classified–Standard (TC-STD) in 1965, and was used during the Vietnam War. Historically, this round was known to be occasionally inaccurate, and the numbers of serviceable rounds in the stockpile were very limited. Additionally, the stockpile of M393A2 cartridges was now, on average, more than 27 years old, well beyond a planned 20-year service life. These facts led Army leadership to conclude that the Army needed new rounds that would meet the MGS's key performance parameter (KPP) performance as good as or better than

the existing HEP round in the defeat of double-reinforced concrete walls.

Once the caliber decision was made, the Project Management Office for Maneuver Ammunition Systems (PMO MAS), and the then Deputy Chief of Staff for Ammunition, requested funding for a new high-explosive round that would meet modern safety and insensitive munitions requirements.

At that time, there were several rounds — believed to be commercial-off-the-shelf (COTS) —

with high-performance claims against concrete walls and dismounted targets.

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Cartridge testing proved these claims were exaggerated. During the third quarter of FY01, and early in FY02, the Product Manager for MGS and PM MAS funded the performance evaluation of stockpiled M393A2 rounds against a newly constructed concrete wall target to prove that the KPP could keep up. This assessment also served as the basis for the performance specification needed

to generate a request for proposal once funding was made available. An



integrated product team (IPT) was assembled to draft the performance specifications and to manage and execute the program. The team consisted of engineers and support elements from PM MAS, the Picatinny-based Army Research, Development and Engineering Center, the Army Research Laboratory and the Joint Munitions Command.

#### Requirement

The Ammunition Performance Requirement was included in the MGS Annex of the Stryker Operational Requirements Document (ORD) to reduce approval time needed to staff a full ORD for the ammunition alone. A detailed ammunition performance specification was written to ensure the ammunition's compliance with MGS and international requirements for 105mm ammunition. The performance specification was reviewed and approved by the user to ensure that it accurately described the desired capability.

A unique acquisition strategy was employed to reduce the fielding time normally associated with ammunition acquisition. Specifically, these munitions were procured as nondevelopmental items (NDIs) using a system contract. The program was initiated at Milestone C in the first quarter of FY02, just prior to being funded. The acquisition plan called for procurement of a small quantity of rounds (bid samples) of NDI cartridges that would meet the per-

formance specification. The aggressive delivery schedule assured the government that samples had been made with the production tooling and were indeed NDI. The samples were evaluated against the performance requirements in a test matrix that was devel-

oped for this solicitation. Awardees of a contract for samples were also required to submit a production proposal along with the samples — including pricing information — prior to government testing and evaluation. Testing was scheduled within 6 months of contract award.

By getting a competitive price for the production upfront, reprocurement costs were kept to a minimum.

### A Winner Emerged

L-3 Communications, BT Fuze Division, in Lancaster, PA, proposed an M393E3 cartridge made by their Bel-

gian subcontractor, MECAR. L-3 also incorporated a MIL-STD-13163-compliant dualsafe fuze made by marrying the proven M739 Safe-and-Arm function with the proven M578 fuze. The modified M578A1 meets all the requirements of MIL-STD-1316E (dual safety).

### The Downselect Process

Based on technical performance, management/quality, past performance and price, a single production contractor would be chosen for the low-rate production (LRP), along with subsequent full-rate production (FRP) for the HE-T and TP-T cartridges.

In July 2002, 4 contracts were awarded

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for 60 samples of both tactical (HE-T) and matching training (TP-T) cartridges with delivery within 6 months of contract award. For the HE-T requirements, contracts were awarded to L-3 Communications, Alliant Techsystems, SNC Technologies Inc. and General Dynamics-Ordnance and Tactical Systems. Three of the four contractors proposed using different variants of an improved M393A2 cartridge (HEP-T) to meet the requirements, while one contractor proposed using a

COTS round produced by Denel in South Africa.

Initial L-3 HEP round tests found that it exceeded the performance requirements for the concrete wall and bunker. Dispersion testing also showed that the round exceeded the accuracy requirement. Based on the test results from other samples and the production proposal, L-3 Communications was selected to produce the LRP for both the tactical and training cartridges. This selection was made in April 2003. L-3 Communications was subsequently awarded a contract for M393E3 and M467E1 cartridge LRP. Most of the initial production tactical cartridges were allocated for an expanded verification test, which mirrored a full-production qualification test.

#### **Positive Results**

The matching M467E1 training round was funded in FY03, permitting the LRP schedules to be sufficiently aligned to provide economies of side-by-side testing and to conserve considerable program resources. The contractor made timely LRP round delivery, improving the first quarter FY04 schedule.

Verification testing was conducted at the Aberdeen, MD, and Yuma, AZ,



Proving Grounds and included firing of the rounds from a vehicle to prove accuracy. At the conclusion of verification testing, PM MAS compiled all of the requirements needed for the TC-STD for both cartridges and to obtain an FRP release.

Program Executive Officer for Ammunition (PEO Ammo) BG Paul S. Izzo approved both TC-STD and FRP Aug. 5, 2004. The IPT is working toward a materiel release for the third quarter, FY05. The program has also been complimented for extensive work done to improve the ammunition's insensitivity to various insensitive munitions stimuli.

## Lessons Learned Summary

By using this novel acquisition approach for the M393E3 and M467E1, the Army substantially reduced

acquisition time and saved considerable resources by "bundling" the two rounds during verification tests. TC-STD and FRP decisions were obtained within

2 years of the first contract award.

The program also averted risk by procuring samples and making an early assessment of the candidate rounds' performance for the downselect decision. By getting a competitive price for the production upfront, reprocurement costs were kept to a minimum. An added advantage to HEP cartridge development was the circumstance afforded by "hiring" the fuze "specialist," L-3 BT Fuze Division, as the integrator since fuzing is historically one of the most challenging tasks in this type of development. The new cartridges provide the Army with a unique capability that is not

available through other means.

The M393A3 and M467 programs are currently managed by PM MAS

COL Mark D. Rider whose office provides direct-fire munitions under the leadership of PEO Ammunition, the Single Manager for Conventional Ammunition. Both organizations are located at Picatinny Arsenal, NJ.

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